

REMARKS

The Office Action dated November 28, 2007 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 7-9, 12-21, and 24 have been amended to more particularly point out and distinctly claim the subject matter of the invention. New claim 25 has been added. No new matter has been added. Therefore, claims 1-25 are currently pending in the application and are respectfully submitted for consideration.

The Office Action objected to claim 7 because the claim recited “selected historical data,” and stated that appropriation correction is required because “the prior mention of selecting ... only relates to [a] measurement device.” Claim 7 has been amended to recite “historical data.” Thus, Applicants respectfully submit that the rejection is mooted, and respectfully request that the rejection be withdrawn.

The Office Action rejected claims 1, 3-19, and 22-24 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,282,427 (“Larsson”) in view of U.S. Patent No. 6,222,483 (“Twitchell”). The Office Action took the position that Larsson discloses all the elements of the claims with the exception of “past measurements,” and “wherein the providing selection information comprises self-learning based upon historical quality information associated with the measurement devices,” as recited in claims 1, 7, 12, 16, 22, and 24; and “the selection information including information of measurement devices that have historically provided measurement information,” as recited in claims 6 and 23.

The Office Action then cited Twitchell as allegedly curing the deficiencies of Larsson. The rejection is respectfully traversed for at least the following reasons.

Claim 1, upon which claims 3-5 are dependent, recites a method, which includes providing quality information regarding quality of results of past measurements associated with location determination by at least two measurement devices, and storing the quality information and identity information associated with the at least two measurement devices. The method further includes providing selection information for selection of measurement devices for future location determinations, based upon the stored quality and identity information. The providing selection information includes self-learning based upon historical quality information associated with the measurement devices.

Claim 6 recites a method, which includes triggering a location process, and obtaining selection information for selection of at least one measurement device, the selection information including information of measurement devices that have historically provided measurement information that satisfies a predefined criteria. The method further includes selecting at least one measurement device, and locating user equipment based on measurement information from the selected at least one measurement device.

Claim 7, upon which claims 8-11 are dependent, recites a method, which includes storing historical data of various measurements in a mobile system, and selecting at least

one measurement device based upon the historical data. The method further includes self-learning based upon historical data associated with measurement devices.

Claim 12, upon which claims 13-15 are dependent, recites a system, which includes at least two measurement devices configured to provide measurement data for location determination, and a quality controller configured to provide quality information regarding quality of results of past measurements by the at least two measurement devices. The system further includes a storage configured to store quality information of measurements by the at least two measurement devices, and a selection controller configured to provide selection information for selection of measurement devices for future location determinations based upon quality information that is stored in the storage. The system is configured to self-learn based upon the quality information regarding the quality of results of past measurements by the at least two measurement devices.

Claim 16, upon which claims 17-19 are dependent, recites an apparatus, which includes a processor configured to process quality information associated with quality of results of past location measurements by a plurality of measurement devices and to provide selection information for selection of at least one measurement device for future location determinations based upon the quality information. The processor is further configured to self-learn based upon the quality information associated with the quality of results of past location measurements.

Claim 22 recites a system, which includes providing means for providing quality information regarding quality of results of past measurements associated with location determination by at least two measurement devices, and storing means for storing the quality information and identity information associated with the at least two measurement devices. The system further includes selecting means for providing selection information for selection of measurement devices for future location determinations based upon the stored quality and identity information. The selecting means includes self-learning means for self-learning based upon historical quality information associated with the measurement devices.

Claim 23 recites a system, which includes triggering means for triggering a location process, and obtaining means for obtaining selection information for selection of at least one measurement device, the selection information including information of measurement devices that have historically provided measurement information that satisfies a predefined criteria. The system further includes selecting means for selecting at least one measurement device, and locating means for locating user equipment based on measurement information from the selected at least one measurement device.

Claim 24 recites a system, which includes storing means for storing historical data of various measurements in a mobile system, and selecting means for selecting at least one measurement device based upon the historical data. The system further includes self-learning means for self-learning based upon historical data associated with measurement devices.

Claim 25 recites an apparatus, which includes processing means for processing quality information associated with quality of results of past location measurements by a plurality of measurement devices, and means for providing selection information for selection of at least one measurement device for future location determinations based upon the quality information. The apparatus further includes means for self-learning based upon the quality information associated with the quality of results of past location measurements.

Thus, embodiments of the invention provide for improved location performance and capacity. In embodiments of the invention where several measurement devices are available, history data can be utilized to select the most efficient measurement device or a measurement device with a lower load. Loading of the mobile system is reduced, and quality of the measurements is improved.

As will be discussed below, the combination of Larsson and Twitchell fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the advantages and features discussed above.

Larsson generally discloses an apparatus and method of selecting location measurement units for measuring an uplink signal transmitted by a mobile communication station operating in a wireless communication network in order to locate the position of the mobile communication station in the wireless communication network. The location measurement units to be used in measuring the uplink signal can be identified by evaluating one or more of relative positional relationships between the

possible position of the mobile station and a plurality of further positions respectively associated with a plurality of location measurement units in the network, path loss measures predicted for each of a plurality of location measurement units relative to the possible position of the mobile station, and geometric dilution of precision (GDOP) values determined for each of a plurality of groups of location measurement units with respect to the possible position of the mobile station. (see Larsson at Abstract).

Twitchell generally discloses a position locating system and method for determining a geographic location of a portable remote unit. The locating system includes a communications system having at least one base station and a system controller. The locating system also includes a server coupled to the system controller by a communication infrastructure external to the communications system. The server includes a data store which contains satellite positioning information. In response to a message from the remote unit, the server provides satellite information to the system controller over the communication infrastructure such that the provided satellite information is passed to the remote unit by the base station. The provided satellite information includes information to aid in acquiring a predetermined number of satellites within a satellite positioning system. The acquired satellites provide coded signals for determining the geographic location of the remote unit. (see Twitchell at Abstract).

Applicants respectfully submit that Larsson and Twitchell, whether considered individually or in combination, fail to disclose, teach, or suggest, all of the elements of the present claims. For example, the combination of Larsson and Twitchell fails to

disclose, teach, or suggest, at least, “wherein the providing selection information comprises self-learning based upon historical quality information associated with the measurement devices,” as recited in claim 1, and similarly recited in claims 7, 12, 16, 22, and 24-25; and “the selection information including information of measurement devices that have historically provided measurement information that satisfies a predefined criteria,” as recited in claim 6, and similarly recited in claim 23.

The Office Action correctly acknowledged that Larsson fails to disclose, teach, or suggest, “wherein the providing selection information comprises self-learning based upon historical quality information associated with the measurement devices,” as recited in claim 1, and similarly recited in claims 7, 12, 16, 22, and 24-25; and “the selection information including information of measurement devices that have historically provided measurement information that satisfies a predefined criteria,” as recited in claim 6, and similarly recited in claim 23. (see Office Action at pages 4 and 5).

Twitchell does not cure the deficiencies of Larsson, as Twitchell, also fails to disclose, teach, or suggest, at least, “wherein the providing selection information comprises self-learning based upon historical quality information associated with the measurement devices,” as recited in claim 1, and similarly recited in claims 7, 12, 16, 22, and 24-25; and “the selection information including information of measurement devices that have historically provided measurement information that satisfies a predefined criteria,” as recited in claim 6, and similarly recited in claim 23.

As described above, Twitchell discloses a position location system and method for determining a geographic location of a portable remote unit. Twitchell discloses that GPS satellite information (for example, ephemerides and timing data) is stored in a satellite information database 54 on an Internet server 56, and upon request, the Internet server provides the GPS satellite information to a wireless communication system 40 for transmission to a remote unit 42. (see Twitchell at col. 6, lines 55-65). Furthermore, Twitchell discloses an algorithm for determining the latitude and longitude of a remote unit 42, where the remote unit 42 formats a message which includes a time stamp and an approximate location of the remote unit 42 and sends the message to a servicing base station 46, which passes the message to the mobile switching center 50. The mobile switching center processes the message by accessing the Internet server 56, which queries the satellite information database 54, utilizing the GPS time and the approximate location of the remote unit 42. (see Twitchell at col. 7, lines 38-46; col. 8, lines 21-33).

Twitchell further discloses that the message containing the retrieved query results contains a value representing a time stamp, and values representing the retrieved satellite information from the database 54 (e.g. GPS satellite almanac, ephemerides, and timing data, etc.). Twitchell discloses that the time stamp is used to generate a time offset used to improve the accuracy of the computations performed at the remote unit 42, i.e. to improve the determination of which GPS satellites are in view. This is done by the Internet server 56 evaluating the time stamp affixed to the message received from the remote unit 42, using the estimated delay to determine the time required for a

transmission of data back to the remote unit 42, and thus, performing its database query so that the satellite information retrieved is as current as possible. Alternatively, the remote unit 42 evaluates the satellite information received from the Internet server 56, specifically the time stamp, and if the time stamp indicates a significant time delay, may ignore the information and make another request for data or modify the received satellite information before use. (See Twitchell at col. 8, line 34 – col. 9, line 17).

Nowhere does Twitchell disclose or suggest that either the Internet server, or the remote unit, is self-learning from the timestamp or the retrieved satellite information stored in the database. Instead, the Internet server is merely filtering the queried data that it sends to the remote unit 42 based on the time stamp, and the remote unit is merely filtering the queried data it receives, or triggering a query of additional data, based on the received time stamp. There is no disclosure or suggestion that the Internet server or remote unit keeps track of which GPS satellites are providing the highest quality measurements, and no disclosure or suggestion that the Internet server or remote unit learns which GPS satellite to select to locate the remote unit in future location scenarios based on certain criteria. Essentially, there is no disclosure or suggestion of a learning process during the location of a remote unit, where it is learned which GPS satellites had the highest quality performance, and where the results of the learning process are used for future locations of a remote unit.

Furthermore, Twitchell does not disclose or suggest that the results of the query include information of measurement devices that have historically provided measurement

information that satisfies a predefined criteria. As described above, the Internet server, or the remote unit, can filter the query to only return results that satisfy a predefined criteria corresponding to the particular request for location information. However, neither the Internet server, nor the remote unit, can filter the query to determine which GPS satellites have historically satisfied a predefined criteria for previous requests, because neither the Internet server, nor the remote unit, records which GPS satellites return measurements that satisfy a predetermined criteria. Thus, because GPS satellite results from previous requests are not recorded, neither the Internet server, nor the remote unit, can select which GPS satellites have historically provided measurement information that satisfied a predefined criteria.

In contrast, according to an embodiment of the present invention, a SMLC obtains the cell identity of a cell serving a mobile station when a request for location information is received, as well as obtaining a valid timing advance. The SMLC calculates a rough location estimate using the cell identity and the timing advance parameter, and then engages in an advanced location attempt, such as a U-TDOA. Thus, a self-learning process is disclosed, where the SMLC is learning how the LMUs perform under certain criteria. Once a sufficient amount of statistical data is collected, the SMLC uses the data to estimate which LMUs are most likely to perform useful measurements. Once it is concluded that a sufficient amount of data is collected, a statistical analysis of the collected data is performed, and the LMU lists are generated, which is another stage of

the self-learning process. (see Specification at 0051-0056). As described above, this self-learning process is not disclosed or suggested in Twitchell.

Furthermore, according to an embodiment of the present invention, the location server may maintain statistical information about which LMUs were able to receive transmissions from a mobile station when certain cell identity and time advance or location estimated based on them were observed, and such information can be used as a selection criteria when selecting proper location measurement units which have provided good quality measurements historically. (see Specification at 0057). Again, as described above, this feature is not disclosed or suggested in Twitchell.

Thus, Applicants respectfully submit that Twitchell, whether considered individually or combined with Larsson, fails to disclose, teach, or suggest, at least, “wherein the providing selection information comprises self-learning based upon historical quality information associated with the measurement devices,” as recited in claim 1, and similarly recited in claims 7, 12, 16, 22, and 24-25; and “the selection information including information of measurement devices that have historically provided measurement information that satisfies a predefined criteria,” as recited in claim 6, and similarly recited in claim 23.

Applicants also respectfully submit that the Office Action has failed to establish a *prima facie* case of obviousness in combining the cited prior art references of Larsson and Twitchell.

As reiterated by the Supreme Court in *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, 82 USPQ2d 1385 (2007), the framework for the objective analysis for determining obviousness under 35 U.S.C. § 103 is stated in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966). Obviousness is a question of law based on underlying factual inquiries. The factual inquiries are: (a) determining the scope and content of the prior art; (b) ascertaining the differences between the claimed invention and the prior art; and (c) resolving the level of ordinary skill in the pertinent art. (see *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, 82 USPQ2d 1385 (2007); *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966); see also MPEP 2141).

The Supreme Court in *KSR* noted that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit. The court stated that “rejections on obviousness cannot be sustained by mere conclusory statements; instead there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” (see *KSR*, 550 U.S. at ___, 82 USPQ2d at 1396; see also MPEP 2141).

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the reference are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). (see also MPEP 2143.01(VI)). Furthermore, if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make

the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). (see also MPEP 2143.01(V)).

Twitchell discloses that one of the objects and advantages of the invention disclosed is to provide satellite ephemerides data from a server that is coupled to the radio telephone system through a communication network external to the radiotelephone system such as the internet. Twitchell further discloses that another one of the objects and advantages of the invention discloses is to provide satellite ephemerides data from a single server that is coupled to one or more radiotelephone systems through a communication network external to the one or more radiotelephone systems. (see Twitchell at col. 3, lines 45-57). Twitchell further discloses that because the storing of the GPS satellite ephemerides and the timing data in the satellite information database on the communication network infrastructure external to the wireless communication system (e.g. an Internet server), a mobile radio telephone user may roam to a network operated by a different wireless service provider and the GPS data is still accessible as long as a current service provider can access the external communication infrastructure. Finally, Twitchell discloses that by implementing GPS positioning using an Internet server, there is no need for a specialized server to support GPS positioning. (see Twitchell at col. 7, lines 5-10 and 28-36).

In contrast, Larsson discloses a mobile location center in a GSM system, which is coupled to a plurality of fixed-site radio transceivers and a plurality of location measurement units. (see Larsson at col. 2, line 66 – col. 3, line 16). Thus, Larsson

discloses a specialized server which supports GPS positioning, which is directly in conflict with the stated objectives of Twitchell. Thus, modifying the system in Larsson with the system in Twitchell changes the principle of operation of the system in Twitchell, and would render the system in Twitchell unsatisfactory for its purpose, as the modified system would require a specialized server to support GPS positioning. Thus, the Office Action has failed to establish a *prima facie* case of obviousness.

Therefore, for at least the reasons discussed above, the combination of Larsson and Twitchell fails to disclose, teach, or suggest, all of the elements of claims 1, 6-7, 12, 16, and 22-24. For the reasons stated above, Applicants respectfully request that this rejection be withdrawn.

Claims 3-5 depend upon claim 1. Claims 8-11 depend upon claim 7. Claims 13-15 depend upon claim 12. Claims 17-19 depend upon claim 16. Thus, Applicants respectfully submit that claims 3-5, 8-11, 13-15, and 17-19 should be allowed for at least their dependence upon claims 1, 7, 12, and 16, respectively, and for the specific limitations recited therein.

The Office Action rejected claims 20-21 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,968,195 (“Nowak”) in view of Twitchell. The Office Action took the position that Nowak discloses all the elements of the claims with the exception of “the processor is further configured to self-learn based upon the quality information associated with the quality of results of past measurements,” as recited in claim 20; and “self-learning based upon the quality information of the results of past

location measurements by the measurement devices,” as recited in claim 21. The Office Action then cited Twitchell as allegedly curing the deficiencies of Nowak. The rejection is respectfully traversed for at least the following reasons.

Claim 20 recites a user equipment, which includes a processor configured to process quality information associated with the quality of results of past location measurements by a plurality of measurement devices of a first type and to provide selection information for selection of which of the plurality of measurement devices of a first type to use for future location determinations based upon the quality information. The processor is further configured to self-learn based upon the quality information associated with the quality of results of past location measurements.

Claim 21 recites a computer program which includes program code configured to perform a method when the program is run on a computer. The method includes providing quality information of results of past location measurements by a plurality of measurement devices of a first type, and obtaining selection information for selection of at least one of the plurality of measurement devices of a first type to use for future location determinations based upon the quality information. The method further includes self-learning based upon the quality information of the results of past location measurements by the measurement devices.

Thus, embodiments of the invention provide for improved location performance and capacity. In embodiments of the invention where several measurement devices are available, history data can be utilized to select the most efficient measurement device or a

measurement device with a lower load. Loading of the mobile system is reduced, and quality of the measurements is improved.

As will be discussed below, the combination of Nowak and Twitchell fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the advantages and features discussed above.

The description of Twitchell is incorporated herein. Nowak generally discloses a method and apparatus for managing the selection of location information sources to provide location information for a mobile communications unit. Embedded within a request for location information on a particular mobile communications unit are one or more specifications regarding the quality of the requested location information. The specifications are used to determine if any location information sources are able to provide the location information with the desired location information quality. Upon locating a location information source capable of providing the requested location information, the source is invoked to the particular location information source. (see Nowak at Abstract).

Applicants respectfully submit that Nowak and Twitchell, whether considered individually, or in combination, fail to disclose, teach, or suggest, all of the elements of the present claims. For example, the combination of Nowak and Twitchell fails to disclose, teach, or suggest, at least, “wherein the processor is further configured to self-learn based upon the quality information associated with the quality of results of past location measurements,” as recited in claim 20, and similarly recited in claim 21.

The Office Action correctly acknowledged that Nowak fails to disclose self-learning based upon the quality information associated with the quality of results of past location measurements by measurement devices. (see Office Action at pages 8 and 9).

Thus, Nowak fails to disclose, teach, or suggest, at least, “wherein the processor is further configured to self-learn based upon the quality information associated with the quality of results of past location measurements,” as recited in claim 20, and similarly recited in claim 21.

Twitchell does not cure the deficiencies of Nowak, as Twitchell, also fails to disclose, teach, or suggest, at least, “wherein the processor is further configured to self-learn based upon the quality information associated with the quality of results of past location measurements,” as recited in claim 20, and similarly recited in claim 21.

While each of the claims of the present application have their own scope, and claims 20 and 21 have separate scope from the rest of the claims of the present application, Applicants respectfully submit that Twitchell fails to disclose or suggest “wherein the processor is further configured to self-learn based upon the quality information associated with the quality of results of past location measurements,” as recited in claim 20, and similarly recited in claim 21, for similar reasons as to why Twitchell fails to disclose or suggest “wherein the providing selection information comprises self-learning based upon historical quality information associated with the measurement devices,” as recited in claim 1, and similarly recited in claims 7, 12, 16, 22, and 24-25, discussed above.

Thus, Applicants respectfully submit that Twitchell, whether considered individually or combined with Nowak, fails to disclose, teach, or suggest, at least, “wherein the processor is further configured to self-learn based upon the quality information associated with the quality of results of past location measurements,” as recited in claim 20, and similarly recited in claim 21.

Therefore, for at least the reasons discussed above, the combination of Nowak and Twitchell fails to disclose, teach, or suggest, all of the elements of claims 20 and 21. For the reasons stated above, Applicants respectfully request that this rejection be withdrawn.

For at least the reasons discussed above, Applicants respectfully submit that the cited prior art references fails to disclose or suggest all of the elements of the claimed invention. These distinctions are more than sufficient to render the claimed invention unanticipated and unobvious. It is therefore respectfully requested that all of claims 1-25 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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Enclosures: Additional Claim Fee Transmittal
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